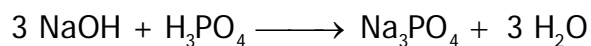


## Chemistry I: Stoichiometry Problem Methods

How many grams of sodium hydroxide will react with 150 grams of phosphoric acid?



### Factor-Label Method

$$150\text{g H}_3\text{PO}_4 \times \frac{1 \text{ mol H}_3\text{PO}_4}{98\text{g H}_3\text{PO}_4} \times \frac{3 \text{ mol NaOH}}{1 \text{ mol H}_3\text{PO}_4} \times \frac{40\text{g NaOH}}{1 \text{ mol NaOH}} = 183.7\text{g NaOH}$$

### Tabular Method

150 g H <sub>3</sub> PO <sub>4</sub>	3 mol NaOH	40 g NaOH	183.7 g NaOH
98 g H <sub>3</sub> PO <sub>4</sub>	1 mol H <sub>3</sub> PO <sub>4</sub>	1mol NaOH	answer

### Ratio Method

Ratio #1 gives the number of moles of substance given in the problem

$$\frac{x \text{ mol H}_3\text{PO}_4}{150\text{g H}_3\text{PO}_4} = \frac{1 \text{ mol H}_3\text{PO}_4}{98\text{g H}_3\text{PO}_4}$$

Ratio #2 converts moles of given substance to moles of asked for.

$$\frac{3 \text{ mol NaOH}}{1 \text{ mol H}_3\text{PO}_4} = \frac{x \text{ mol NaOH}}{1.53 \text{ mol H}_3\text{PO}_4}$$

Ratio #3 converts moles of asked for substance into grams of asked for substance

$$\frac{x \text{ g NaOH}}{4.6 \text{ mol NaOH}} = \frac{40\text{g NaOH}}{1 \text{ mol NaOH}}$$

Answer= 184 g NaOH